

SECTION VII.—WEATHER AND DATA FOR THE MONTH.

THE WEATHER OF THE MONTH.

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PRESSURE.

The distribution of the atmospheric pressure over the United States and Canada and the prevailing direction of the winds are graphically shown on Chart VII, while the average values for the month at the several stations, with the departures from the normal, are shown in Tables I and III.

The mean barometric pressure for the month was below the normal from Iowa and Minnesota eastward; also over most of North Dakota, the northeastern portion of Montana, and in a few local areas to the westward of the Rocky Mountains. The monthly means were likewise below the normal in most sections of the Canadian Provinces. Elsewhere the pressure was, as a rule, above the normal. The minus departures were generally small, but were greatest in the region of the Great Lakes and in the adjacent Canadian districts. The plus departures were also small, being mostly less than 0.04 inch.

During the first few days of the month pressure was relatively high from the Rocky Mountains eastward, but about the 3d a rather pronounced low area appeared in the Northwest, and during the following few days it moved eastward, but with decreasing intensity. Thereafter till near the middle of the month no pronounced abnormal pressures obtained, but there was a tendency to relatively high readings in most districts. From the 14th to the 20th moderately high pressure was the rule over eastern districts, but during the first few days of the last decade of the month rather low readings were recorded along the northern border to the eastward of the Rocky Mountains, especially in the region of the Great Lakes, and like conditions obtained in those districts on the 27th and 28th. The month closed with an extensive area of high pressure overlying the districts from the Mississippi Valley eastward.

The distribution of the highs and lows was such as to favor prevailing southerly winds in most sections from the Great Plains States eastward, except that in the Southeastern States the direction of greatest frequency was northeast. In the Pacific coast region there were frequent northerly winds during the month, while in most of the Rocky Mountain and Plateau districts variable winds prevailed.

TEMPERATURE.

During the first few days of the month high temperatures obtained in the northern Rocky Mountain districts, 102° being recorded at Miles City, Mont., on the 2d, but at the same time cool weather prevailed in portions of New York and New England where local frosts occurred on the mornings of the 3d and 4th, and on the 4th a sharp fall in temperature occurred in the mountain districts of the West. The temperature for the first decade of the month averaged considerably above the normal in nearly all districts to the eastward of the

Rocky Mountains, but in the western Plateau States it was cooler than usual for the season of the year.

The second decade brought much lower temperatures to interior districts, the week ending September 19 being exceptionally cool for the season in the upper Mississippi and central Missouri valleys, where the average temperature for the week ranged from 10° to 12°, or more, below the normal.

No marked temperature changes occurred during the last decade until near the end of the month, when an extensive high-pressure area overspread the country from the Rocky Mountains eastward, accompanied by a sharp fall in temperature in those districts. On the morning of the 28th freezing temperatures occurred in northern Minnesota, the Dakotas, western Nebraska, Wyoming, and Montana, and at the close of the month frosts had occurred in the Ohio and Mississippi valleys as far south as western Tennessee.

The mean temperature for the month was near the normal in nearly all sections of the country, the departures being generally less than 3°, except locally in the northern Great Plains and adjacent Rocky Mountain districts, where the minus values were slightly more than 3°, and in the San Francisco Bay section, where similar plus departures were recorded. No marked extremes of temperature occurred over wide areas during the month, although locally there were rather high readings for the season, the maximum being 110° at Yuma, Ariz., on the 1st. Freezing temperatures occurred at a few scattered points in New England, northern New York, Michigan, and Wisconsin, and generally in Nebraska, the Dakotas, and Montana. The lowest reading reported for the month was 21° at Yellowstone Park, Wyo., on the 21st.

PRECIPITATION.

During the first decade of the month showers were rather frequent in the central and northern districts to the eastward of the Rocky Mountains, and some heavy local falls occurred in the Ohio Valley on the 1st and in the region of the Great Lakes and the upper Mississippi Valley from the 3d to the 8th. At the beginning of the second decade generous rains fell in most districts between the Mississippi River and the Rocky Mountains, which largely relieved the severe drought that had prevailed for a long time in some sections of that area. During most of this decade, however, rainfall was generally light and local, although quite extensive and substantial rains occurred in the Gulf and Atlantic coast districts from the 12th to the 15th. During the first half of the last decade only light local showers occurred, but on the 26th general rains set in from Idaho to the Lake region, and during the closing days of the month the rain area overspread nearly all districts to the eastward of the Rocky Mountains.

The total rainfall for the month as a rule was less than the normal to the eastward of the Mississippi River. It was heavier than usual in portions of California, Iowa, Wisconsin, upper Michigan, and the interior of the northeastern States. The monthly totals were less than one-half inch in large areas to the westward of the Rocky Mountains; also in eastern Colorado, and the western portion of Nebraska and South Dakota. No heavy rainfall

of special note occurred during the month in any section of the country. The heaviest recorded monthly amounts fell in the eastern portion of North Carolina and the Florida Peninsula, the central portions of Pennsylvania and New York, and in the upper Mississippi Valley and upper Lake region, where limited areas received as much as 6 inches.

RELATIVE HUMIDITY.

The mean relative humidity for the month was below the normal in most districts to the eastward of the Rocky Mountains, the only noteworthy exceptions being the northern border States from the region of the Great Lakes westward and locally in the Great Plains region, where the month as a whole was damper than usual. From the Rocky Mountains westward the atmosphere was also relatively damp in the northern and the southern districts, but in the central States, including Colorado, Utah, Wyoming, southern Idaho, and most of Nevada, as well as in the central Pacific coast district, the month was drier than the average.

GENERAL REMARKS.

The weather during September, 1916, was generally favorable for the prosecution of fall work, and rapid progress was made in seasonal farming operations. Harvesting and the threshing of grain advanced rapidly with little interruption, although rain caused some delay to this work in the upper Mississippi Valley and portions of the Rocky Mountain and North Pacific States. The weather was favorable for fall plowing and seeding in most districts, but there was considerable complaint of the soil being too dry for proper preparation and for germination of seed in some localities. The month was exceptionally favorable for the gathering of cotton, hay, and fodder, but at the close of the month fall pastures, late feed crops, and late truck and gardens were, as a rule, much in need of rain.

Average accumulated departures for September, 1916.

| Districts. | Temperature. | | | Precipitation. | | | Cloudiness. | | Relative humidity. | |
|--------------------------------|-------------------------------------|----------------------------------|-------------------------------------|-------------------------------------|----------------------------------|-------------------------------------|-------------------------------------|------------------------|-------------------------------------|------------------------|
| | General mean for the current month. | Departure for the current month. | Accumulated departure since Jan. 1. | General mean for the current month. | Departure for the current month. | Accumulated departure since Jan. 1. | General mean for the current month. | Departure from normal. | General mean for the current month. | Departure from normal. |
| | ° F. | ° F. | ° F. | In. | In. | In. | 0-10 | | Perct. | |
| New England..... | 60.8 | +0.5 | +5.8 | 2.48 | -0.80 | -2.00 | 4.6 | -0.6 | 73 | -2 |
| Middle Atlantic..... | 65.9 | -0.7 | +5.8 | 2.48 | -0.80 | -3.00 | 4.0 | -0.6 | 73 | -4 |
| South Atlantic..... | 72.2 | -0.8 | +8.4 | 2.02 | -1.80 | -9.50 | 3.9 | -0.8 | 71 | -3 |
| Florida Peninsula..... | 80.5 | -0.5 | +2.6 | 4.52 | -2.80 | -9.30 | 5.2 | -0.2 | 78 | -3 |
| East Gulf..... | 74.6 | 0.0 | +6.6 | 2.23 | -0.90 | -0.30 | 3.4 | -1.2 | 74 | -2 |
| West Gulf..... | 76.7 | +0.6 | +11.4 | 2.44 | -1.00 | -4.50 | 3.4 | -0.8 | 69 | -5 |
| Ohio Valley and Tennessee..... | 66.6 | -1.4 | +0.8 | 2.72 | 0.00 | -0.30 | 3.7 | -0.7 | 70 | -2 |
| Lower Lakes..... | 62.9 | -0.2 | +0.4 | 2.56 | -0.20 | -1.20 | 5.1 | +0.3 | 68 | -5 |
| Upper Lakes..... | 58.2 | -1.2 | +0.7 | 3.82 | +0.70 | +1.90 | 5.9 | +0.7 | 76 | -1 |
| North Dakota..... | 55.4 | -1.6 | -15.6 | 1.30 | -0.10 | +0.90 | 4.4 | 0.0 | 72 | +6 |
| Upper Mississippi Valley..... | 62.8 | -1.3 | +2.8 | 3.71 | +0.20 | -1.00 | 4.7 | +0.4 | 73 | +1 |
| Missouri Valley..... | 64.8 | -0.5 | +3.3 | 2.48 | -0.20 | -5.50 | 3.5 | -0.5 | 67 | +1 |
| Northern slope..... | 56.2 | -1.1 | -10.8 | 0.95 | -0.20 | -0.10 | 3.6 | -0.4 | 57 | +2 |
| Middle slope..... | 68.6 | -0.1 | +4.0 | 1.61 | -0.60 | -4.00 | 3.2 | -0.2 | 59 | +1 |
| Southern slope..... | 72.1 | -0.7 | +15.1 | 1.28 | -1.30 | -4.40 | 3.1 | -0.7 | 61 | -2 |
| Southern Plateau..... | 70.0 | -0.6 | -1.1 | 0.92 | -0.10 | +1.00 | 2.4 | -0.1 | 47 | +8 |
| Middle Plateau..... | 62.6 | 0.0 | +2.5 | 0.42 | -0.20 | +0.20 | 1.8 | -1.1 | 37 | -1 |
| Northern Plateau..... | 60.8 | -0.4 | -14.9 | 0.25 | -0.50 | +1.70 | 3.4 | -0.2 | 45 | -1 |
| North Pacific..... | 59.9 | +1.1 | +6.0 | 0.98 | -1.80 | -6.10 | 4.9 | -0.4 | 76 | +4 |
| Middle Pacific..... | 63.9 | +0.5 | +0.6 | 0.89 | +0.10 | +0.50 | 3.1 | -0.3 | 60 | -7 |
| South Pacific..... | 66.5 | -0.8 | -1.4 | 0.84 | +0.60 | +5.10 | 2.9 | +0.3 | 71 | +5 |

WEATHER CONDITIONS ON THE NORTH ATLANTIC OCEAN DURING SEPTEMBER, 1916.

The data presented are for September, 1915, and comparison and study of the same should be in connection with those appearing in the REVIEW for that month. Chart IX (XLIV-121) shows for September, 1915, the averages of pressure, temperature, and the prevailing direction of the wind at 7 a. m., 75th Meridian time (Greenwich mean noon), together with the locations and courses of the more severe storms of the month.

PRESSURE.

The distribution of the average pressure for the month, as shown in Chart IX, presents few unusual aspects. The Azores HIGH was practically normal in location and intensity, and the same can be said of the Icelandic LOW, which was but slightly south of its normal position. A slight depression of 30 inches surrounded the Bermudas, due to unusually low pressure during the first decade of the month, and the continental HIGH with a crest of 30.10 inches was central near Elkins, W. Va., extending as far east as the 72d meridian. While the average pressure gradients for the month were not steep, the range of pressure from day to day was very marked in some localities. In the 5-degree square that includes St. Johns, Newfoundland, the barometer readings ranged from 30.28 inches on September 2 to 28.85 inches on the 27th, the monthly mean being 29.86 inches.

As a rule, north of the 35th parallel and west of the 55th meridian, the pressure was above the average during the first decade of the month, also from the 13th to the 17th, and from the 23d to the 25th, while a marked depression existed from the 27th to the 30th. During the remaining periods of the month the pressure was not far from normal. In the waters adjacent to the European coast, high pressure prevailed from the 5th to the 11th, and from the 15th to the 17th, while low barometric readings were reported from the 25th to the 29th. Unusually low pressure existed in the vicinity of the Bermudas between the 2d and the 9th, the lowest barometric reading, 29.17 inches, occurring on the 3d. This unusual reversal of normal conditions affected the monthly mean to a slight extent, and was responsible for the low shown on Chart IX, and mentioned previously. The West Indian hurricane that prevailed from September 22 to October 2 caused low pressures for a number of days in the Caribbean Sea and Gulf of Mexico, but did not affect the monthly means materially.

GALES.

On Chart III (XLIII-106) Tracks of Centers of Low Areas, for September, 1915, a LOW (I on Chart IX) is shown that first appeared on September 2 about 4° east of Bermuda. The path followed by this disturbance was unusually erratic. After starting toward the northwest, it curved toward the south and southeast, then, recurving through the west and northwest, it started in a northeasterly direction and on the 9th was central near latitude 35°, longitude 65°, where a number of vessels reported southeasterly to southwesterly gales of from 40 to 55 miles an hour.

The disturbance continued in its northeasterly course with an increased rate of movement, and on the 10th the center was near latitude 40°, longitude 61°. Heavy winds still prevailed south of the center, decreasing as the American coast was approached, while fog was encoun-